NEW PHASE OF ARMS RACE: FIRST STRIKE

The issue of "first strike weapons" has emerged as the single most controversial issue creating the current tension between the two superpowers. The Reagan administration has charged that recent advances in SS-18 and SS-19 missile accuracy make it possible for the Soviets to launch a first strike aimed at Minuteman missile silos. The President has declared that we are entering a "window of vulnerability" in which the U.S., for the next few years, will be vulnerable to a Soviet first strike until the U.S. develops the MX missile.

The Soviets, in turn, have charged that the MX missile itself is a first strike weapon. They have also charged that the U.S. is deploying the highly accurate Pershing II in Europe, which will be able to "decapitate" the Soviet leadership and command centers within only 6 to 8 minutes of launch. In retaliation for Pershing II deployment, the Soviets have stated that they will deploy submarines off the coast of the U.S. which can reach their targets within minutes.

Although the U.S. and the Soviet Union have heatedly traded charges and counter-charges on the question of "first strike weapons," what they can both agree on, however, is that the arms race is entering a period of great instability, with a new generation of precision-guided missiles making land-based ICBM's increasingly vulnerable to a first strike. The arms race, which has been relatively stable for the past 20 years, is rapidly collapsing.

What is fueling this revolution in weaponry is recent breakthroughs

in computer technology, which make it possible to hurl 10 hydrogen bombs in a single missile over 6,000 miles and place each of them within a football field. This is comparable to firing a bullet over a distance of 5 miles and hitting the eye of a fly.

With this kind of accuracy, it becomes possible for the first time in history to destroy the enemy's forces in a pre-emptive first strike.

Imagine, for the moment, two nearsighted cowboys, each armed with a lethal stockpile of rocks. Each cowboy knows that a first strike with rocks will only wound the enemy, creating a devastating retaliation in which both cowboys will be stoned to death. In effect, a first strike is tantamount to suicide. This is called the nuclear stalemate, or the "balance of terror." Neither side can mount a knock-out blow which wipes out the enemy's nuclear force in one stroke. Historically, the missile forces of the Soviet Union and the U.S., with accuracies measured in miles, were like rocks, too clumsy to execute a surgical strike on the other's missile silos.

Now imagine, however, what happens if someone invents a gun and a bullet proof vest. The stalemate is instantly broken. Each cowboy will scramble to obtain a gun in order to attain first strike capability. The side with the gun will be able to strike with deadly accuracy and blow the rocks out of his hand. The gun is analogous to the new generation of precision-guided missiles, which can place a hydrogen bomb within a few hundred feet of enemy missile silos. The bullet proof vest is analogous

assumes. Last words only (at best) against 2d. strike.

to a "Star Wars" nuclear shield, designed to shoot down any stray enemy missiles which may have escaped a first strike.

Not only do these weapons make a first strike possible, these weapons also create an incentive to launch a first strike, especially in a crisis situation. In a state of fear, for example, each cowboy feels intense pressure to fire his gun because he knows that, if he waits too long, the enemy may fire first and destroy your forces. Either you strike first, or the enemy will launch a first strike against you. These weapons create a situation where you must strike first out of fear that you will no longer be able to strike second. So what? Rather, from that standing second will be "less worse," and is "too probable."

This creates the "use 'em or lose 'em" situation. If you wait too long, then the enemy will destroy your missiles. This means you must fire your weapons while you still can.

In fact, with these precision-guided weapons, a second strike becomes pointless. There is no sense in hitting empty enemy missile silos. Thus, these weapons are only effective in a pre-emptive first strike.

In conclusion, these weapons have completely overturned the cherished notions behind the nuclear stalemate and MAD (Mutual Assured Destruction). Instead of creating more security, they have created a volatile situation which is rapidly spiraling out of control.

WHAT IS A FIRST STRIKE?

Most people visualize a first strike as one great spasmodic firing of tens of thousands of missiles, in which hundreds of cities are consumed by the blast and hundreds of millions die of atomic fall-out.

This popular conception, however, is inaccurate.

A disarming first strike is a carefully orchestrated, multi-layered surgical strike on the enemy's missile silos, disarming the enemy and making a second strike impossible. The enemy's nuclear force, not his cities, are the primary targets.

A hypothetical first strike might look like this in the opening moments of World War III:

0 to 5 minutes: killer satellites destroy the enemy's early warning system, blinding him. Hydrogen bombs are then detonated over key cities and military installations, creating a shock wave (the electromagnetic pulse) which scrambles communications for hundreds of miles. Killer submarines lock onto and destroy enemy subs.

6 to 8 minutes: "decapitating weapons" (such as the Pershing or Soviet subs off the U.S. coast) destroy the key command centers of the enemy, leaving the enemy forces leaderless.

15 minutes: the bulk of submarine-launched missiles arrive, destroying enemy missiles in their silos, bombers on their air fields, and submarines in their ports.

30 minutes: the bulk of the ICBM force lands, destroying the remaining missiles, subs, and bombers.

30 minutes to one hour: stray enemy missiles that managed to escape the first strike are now shot down by a limited "Star Wars" missile defense system.

Thus, instead of being one explosive firing of tens of thousands of missiles, we see that a disarming first strike is actually a sophisticated, carefully orchestrated multi-layered scenario requiring several weapons systems to fire in perfect synchronization.

The strategy which targets the enemy's cities, which is the popular but obsolete conception of nuclear war, is called "countervalue," because it destroys objects of value (i.e. cities and people). However, the revolutionary new generation of precision-guided missiles makes possible yet another strategy called "counterforce," which targets the enemy's military force. A counterforce attack, in effect, spares the enemy's cities but destroys the enemy's ability to retaliate. This is classically how armies have traditionally won wars.

"Counterforce," then, is based on the same military strategies that are used to fight conventional wars. Like conventional military strategy, it assumes that nuclear wars can be fought to victory or to defeat.

Of course, neither superpower possesses "first strike capability." The missiles now currently deployed are simply too crude and too inaccurate to execute this kind of scenario.

However, the main danger comes from the late 1980's and early 1990's, when these first strike weapons will reach final deployment.

Because of the short flight time of these weapons, it creates enormous pressure to fire these weapons at the slightest hint of an enemy missile attack.

Refering back to the analogy with the cowboys, if one cowboy thinks he hears the "click" of the enemy's gun, he can't take a chance that it was caused by a twig. If he hesitates too long, he might be killed. Thus, the cowboy that thinks he hears the "click" of his enemy's gun must fire while he is still alive.

Similarly, if a superpower detects a series of blips on the radar screen, he cannot take a chance that it was meteorites or a storm. If he waits 6 to 8 minutes, he may be dead. Thus, he has to fire.

Even if neither side desires to launch a first strike, the situation can still spiral out of control because it puts pressure on the superpowers to adopt a "launch on warning" policy, in which computers will be given permission to launch nuclear war. With flight times measured in minutes, no human can tell the difference between a missile attack or meteorites or even birds. Thus, the superpowers will allow their computers the ability to launch a nuclear war.

This creates a dangerous, hair trigger situation. Life-and-death decisions must be made within a matter of seconds by computers, which astronomically increases the danger of accidental war.

Even if the generals on neither side wish to unleash a nuclear war, eventually the generals may become captives of their own computer "launch

on warning" policy. A "launch on warning" policy puts the fate of the world on computers, which are known to fail with disturbing regularity. For example, several thousand small misfires in our computer warning system have taken place within the last few years, mainly because of atmospheric disturbances. On a few occasions within the past five years, however, these incidents have actually set off full-scale nuclear alerts.

A "launch on warning" policy is perhaps the most ominous step towards nuclear war.

IS A SUCCESSFUL FIRST STRIKE POSSIBLE?

A first strike, if it is to be successful, must accurately place several thousand warheads virtually on top of the enemy's missile silos within a matter of minutes, before he can launch a retaliatory second strike.

In order to reliably destroy an enemy missile silo, a warhead must score within a bull's eye which is roughly 600 feet in radius. If a warhead lands considerably outside this 600 foot circle, then its chances of destroying the silo diminishes rapidly. However, if the warhead falls within the 600 feet circle, then its kill probability (or SSPK: single shot probability of kill) rises dramatically.

Historically, missile accuracy was measured in miles. Since a modern city is roughly 10 miles across, the missiles of the 1960's were perfectly capable of destroying the enemy's population, but unable to execute a counterforce attack. Thus, the superpowers were locked into a nuclear stalemate.

This stalemate, however, is now being broken by a new generation of weapons which for the first time are now penetrating within this 600 foot limit.

For example, the published accuracies of these new precision-guided weapons fall within this limit:

Minuteman (with improved Mark 12A warhead): 600 feet

MX: 300 feet

Trident II: 400 feet

Pershing II: 100 feet

(The accuracy of Soviet missiles is harder to estimate, but the CIA estimates that the accuracy of the SS-18 and SS-19 are approaching 1,000 feet. This number is expected to drop as the Soviets steadily improve their inertial guidance systems.)

Notice that the accuracy of all these newer missiles are within the 600 foot circle. These missile accuracies are expected to fall within even 100 feet by the late 1980's and early 1990's. This is because of the NAVSTAR navigation satellite, which will give mid-course corrections to the missiles while in flight, and because of the MARV warhead, which is a maneuverable warhead which adjusts its trajectory and locks onto its target within seconds of impact.

With missile accuracy falling within 100 feet, the SSPK kill probability rises to about 95%. If you target two warheads per enemy missile, then the kill probability approaches 99%.

At first, it seems that the superpowers are rapidly closing in on first strike capability. However, there are several factors which still make a first strike a "cosmic roll of the dice."

Because the U.S. can place about 12,000 strategic and tactical warheads on the Soviet Union, while the Soviets can place about 9,000 warheads on the U.S., a successful first strike must destroy about 99%

of the enemy's missile force. (As little as 300 warheads landing on either the Soviet Union or the United States will send these nations back to the industrial and population level of the 1700's, when both countries were simple agrarian societies. In fact, 300 warheads is enough to destroy every city in either the U.S. or the Soviet Union.)

If a first strike accidentally fails to achieve a 99% successful destruction of the enemy's missile force, then the country which initiated the first strike will suffer enormous damage from the second strike.

Several factors argue against achieving such fantastically high kill probabilities.

1) In a first strike, thousands of missiles will be fired over the North Pole. However, neither superpower has ever fired its missiles over the North Pole, where gravitational and magnetic anomalies may be enough to cause missiles to stray off course. (Satellites, of course, have been fired in polar orbits, but satellites have different trajectories than ICBM flight paths.)

2) Minute errors in missile guidance systems may cause the missiles to fall outside the 600 foot circle. Even an error of <u>one part in a hundred million</u> in the firing of the missile's propellant or the aiming of its guidance system is enough to add errors of 1,000 feet in accuracy, making a first strike impossible.

(Oddly enough, "nuclear winter" does not necessarily make a first

strike obsolete. Nuclear winter is caused by the massive smoke and soot created by firestorms initiated by an atomic attack. The ash sent into the upper atmosphere from as little as 100 megatons may be enough to cut off the sun's rays and cause freezing temperatures in the northern hemisphere. Because a counterforce attack does not specifically target the enemy's cities (unless their missile silos are close to their cities), a first strike will not cause the firestorms which are the principal cause of nuclear winter. A counterforce attack will send up large quantities of steel, glass, and dirt into the atmosphere, but will not necessarily trigger the fires which are the source of nuclear winter.)

In conclusion, no matter now accurate the next generation of missiles are, there are still great uncertainties in the execution of a 99% effective first strike. The real danger, then, is not that a first strike will be perfectly successful; the danger is that, in a crisis, one side may launch a first strike out of desperation or fear that the enemy is about to mount a first strike of his own.

"STAR WARS": FIRST STRIKE WEAPON?

Although "Star Wars" anti-ballistic missile systems have been presented to the public as a nuclear shield capable of destroying any Soviet missile attack, the scientific community has been less than optimistic. Very simple defensive measures can be taken by the Soviets to confuse or destroy a U.S. "Star Wars" system, for example firing thousands of decoy or dummy warheads, spraying metallic chaff to confuse radar, painting warheads to reflect back most of the laser beam, using killer satellites to blow-up laser battlestations in outer space, etc. Or, more ominously, the Soviets may simply double or triple the number of their warheads to overwhelm any "Star Wars" system.

Even the most optimistic advocate of ABM systems admits that there are large uncertainties about the effectiveness of such a shield, which must be 99% effective to stop a full-scale Soviet first strike.

However, it has long been known that even a primitive ABM system has a great advantage as a first strike weapon.

If either superpower achieves an ABM system which is, for example, 70 to 80% effective, the system may flunk as a defensive system but may be quite effective as a first strike weapon. After a first strike, the enemy will be able to mount only a weakened retaliatory second strike, and therefore the ABM may be effective in shooting down this feeble attack.

In fact, an ABM system has its maximum effectiveness in a first strike. While an ABM system that can withstand an enemy first strike may

be hoplessly beyond present technology, an ABM system which can withstand a weakened second strike from the enemy may actually be possible.

The greatest military application of an ABM system, therefore, is to be able to launch a first strike from behind the nuclear shield. Although a 99% effective nuclear shield may be several decades away, an ABM system which is 70 to 80% effective against a weakened second strike may actually be possible.

Furthermore, an ABM system may actually provoke a nuclear war.

As one superpower gradually approaches a reasonably effective ABM system, the other superpower which is lagging in ABM technology will begin to fear that he will become the victim of a first strike. As a result, the side which is lagging in ABM research will become frightened, knowing that it may soon be incapable of retaliating after a first strike. As a result, he may launch a first strike of his own, realizing that any delay may mean defeat.

Thus, instead of creating a nuclear shield to save billions of lives, an ABM system may actually frighten the enemy into launching a first strike before the ABM system becomes operational. Fearful that he will not be able to launch a second strike, he will be forced into launching a first strike of his own.